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AF 2815

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Applicant: | Youngmin Kim, et al. | Docket No: | TI-31160 |
| Serial No: | 10/028,002 | Conf. No: | 2425 |
| Examiner: | Jesse A. Fenty | Art Unit: | 2815 |
| Filed: | 12/20/2001 | | |
| For: | HIGH PERFORMANCE PNP BIPOLAR DEVICE FULLY COMPATIBLE WITH CMOS PROCESS | | |

## APPEAL BRIEF UNDER 37 C.F.R. 1.192

MAILING CERTIFICATE UNDER 37 C.F.R. §1.8(A)
I hereby certify that this Appeal Brief filed, in triplicate, under 37 CFR 1.192 is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on 1-20-04.

Ann Trent
Ann Trent

Mail Stop Appeal Brief - Patents
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The following Appeal Brief is respectfully submitted in triplicate and in connection with the above identified application in response to the final rejection mailed September 3, 2003, and the Advisory Action mailed November 14, 2003.

Real Party in Interest under 37 C.F.R. 1.192(c)(1)

Texas Instruments Incorporated is the real party in interest.

Related Appeals and Interferences under 37 C.F.R. 1.192 (c)(2)

There are no related appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the board's decision in the pending appeal.

Status of Claims on Appeal under 37 C.F.R. 1.192 (c)(3)

Claim 1 was previously amended, claim 2 was canceled, claim 3 was previously amended, claims 4-8 were canceled, and claim 9 was withdrawn. Claims 1 and 3 are appealed.

Status of Amendments Filed After Final rejection under 37 C.F.R. 1.192 (c)(4)

The amendment filed on 10/21/2003 was no deemed to place the application in condition for allowance.

Summary of the Invention under 37 C.F.R. 1.192(c)(5)

The instant invention describes a PNP BJT (Figure 2) with increased emitter efficiency. This is formed by reducing the depth of the p well implant (340 in Figure 2, page 5, lines 12-16) to increase the carrier concentration in the emitter and making the emitter junction deeper to increase the minority carrier lifetime in the emitter (page 5, lines 16-20). As shown in Figure 3, region 304 defines the emitter region and region 310 the base region, and the underlying P (blanket implant) region defines the collector region. An embodiment of the various doping concentration profiles through the emitter region (304 in Figure 3), the base region (310 in Figure 3), and the collector region (p (blanket implant) in Figure 3) is shown in Figure 4. As described on page 9, lines 15-17), the ratio of the doping concentrations in the emitter and the base regions measured at 75% and 125% of the base emitter junction depth is greater than two to one. Therefore at the described regions (i.e. at 75% and 125% of the base emitter junction depth), the doping concentration in the emitter is more than twice the doping concentration in the base.

Statement of Issues Presented for Review under 37 C.F.R. 1.192 (C)(6)

1. Are claims 1 and 3 properly rejected under 35 U.S.C. 102(b) as being anticipated by Yagi et al. (U.S. 4,027,324)?

Statement of the Grouping of Claims under 37 C.F.R. 1.192(C)(7)

Claims 1 and 3 stand or fall together.

Arguments

1. Are claims 1 and 3 properly rejected under 35 U.S.C. 102(b) as being anticipated by Yagi et al. (U.S. 4,027,324)?

Appellants contend that claims 1 and 3 are improperly rejected under 35 U.S.C. 102(b) as being anticipated by Yagi et al (U.S. 4,027,324).

Claim 1 comprises the limitations of at least one PNP bipolar transistor with an emitter diffusion that combines a P-well and a P+ diffusion, an N-well base diffusion, and emitter and base diffusions jointly defining an emitter:base ratio of near-junction dopants, measured at 75% and 125% of the emitter-base junction depth, which is greater than two to one.

For a 102(b) reference to be valid each and every element of the claim must be found in the reference. Claim 1 of the instant invention claims a PNP transistor. The reference cited by the examiner shows and describes a NPN transistor. There is a general reference to a PNP transistor in column 7, line 15 but no elements of the PNP transistor are described. Therefore the cited reference does not describe a PNP transistor with the required elements. Such a general reference does not satisfy the requirements of 102(b).

As described above, claim 1 comprises the limitation of emitter and base diffusions jointly defining an emitter:base ratio of near-junction dopants, measured at 75% and 125% of the emitter-base junction depth, which is greater than two to one. In the examiners explanation dated 11/14/2003, the examiner cites portions of the Yagi et al. patent that describes the doping of a p-type base region and an n-type emitter region. Claim 1 requires a p-type emitter and an n-type base. In addition, Claim 1 requires that an emitter:base ratio of near-junction dopants, measured at 75% and 125% of the emitter-base junction depth, which is greater than two to one. The examiner, in the response dated 11/14/2003, is silent as to the doping concentration relationships described in the Yagi et al. patent. Appellant maintains that the doping concentrations of the emitter and base regions described in claim 1 is not found in the Yagi et al. patent and claim 1 allowable over the cited art.

In addition, claim 3 depends on claim 1 and contains the limitations of claim 1. Claim 3 is also allowable over the cited art.

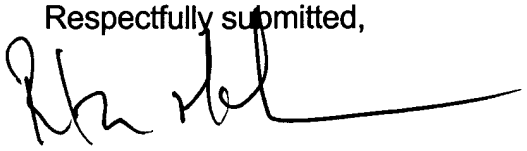
Conclusion

For the foregoing reasons, Appellants respectfully submit that the Examiner's final rejection of Claims 1 and 3 under 35 U.S.C. § 102 is not properly founded in law, and it is respectfully requested that the Board of Patent Appeals and Interferences so find and reverse the Examiner's rejections.

To the extent necessary, the Appellants petition for an Extension of Time under 37 CFR 1.136. Please charge any fees in connection with the filing of this paper,

including extension of time fees, to the deposit account of Texas Instruments Incorporated, Account No. 20-0668. **This form is submitted in triplicate.**

Respectfully submitted,



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## APPENDIX

## Claims on Appeal

1. An integrated circuit, comprising:

    at least one PNP bipolar transistor, comprising:

    an emitter diffusion which has a doping profile that combines a P-well and a P+ diffusion;

    a base diffusion comprising a N-well that at least partly underlies said emitter diffusion wherein

    said emitter and base diffusions jointly defining an emitter:base ratio of near-junction dopants, measured at 75% and 125% of the emitter-base junction depth, which is greater than two to one.

3. The integrated circuit of Claim 1 further comprising a blanket P-type diffusion component having a peak concentration depth more than twice that of said P-well.

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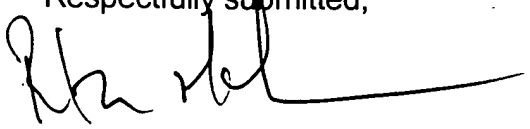

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